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09/777,863	02/07/2001	Alexander Mark Franz	0026-0008	4022

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/777,863	FRANZ ET AL.
	Examiner	Art Unit
	Martin Lerner	2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _21 January 2005_.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1 to 24_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) _20 to 24_ is/are allowed.

6)☒ Claim(s) _1 to 4 and 8 to 19_ is/are rejected.

7)☒ Claim(s) _5 to 7_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.   Claims 1, 2, 8, 10 to 12, and 17 to 19 are rejected under 35 U.S.C. 102(e) as

being anticipated by *Weber ('524)*.

Regarding independent claims 1, 17, and 18, *Weber ('524)* discloses a method,

system, and computer-readable instructions, comprising:

"means for receiving the voice search query from the user" – microphone 110

captures one or more spoken words (column 7, lines 8 to 9: Figures 1 and 3A: Step

300); the system comprises a speech processor for searching grammar files and a

natural language processor for searching a database for a matching entry (column 2,

lines 58 to 67); generally, the method and system provides for searching databases for

information about news, stocks, weather, movies, and web pages (column 11, line 50 to

column 13, line 59);

"means for deriving one or more recognition hypotheses from the voice search

query" – grammars are searched for a matching word or phrase of the utterance

(column 7, lines 31 to column 8, line 10: Figure 3A: Steps 304, 310, and 316); the

natural language processor database 218 is searched for possible matches to the

phrase, based on whether the NLP database 218 contains any of the words in the

phrase (or their synonyms), and the relative weights of those words (column 10, lines 45

to 49: Figures 2 and 3B: Step 336);

"means for associating a weight with each of the recognition hypotheses" –

individual words in the phrase are weighted according to their relative importance or

significance to the overall meaning of the phrase by word weighter 208 (column 10,

lines 17 to 30: Figures 2 and 3B: Step 334); a confidence weight is generated for each

of the possible matching entries based on the number of occurrences of each of the

words in the phrase and their relative weights (column 10, lines 49 to 61: Figure 3B:

Step 338);

"means for construction a weighted boolean query using the recognition

hypotheses" – boolean tester 210 performs a boolean "AND" test to determine whether

each one of the non-noise words in the phrase (or its synonym) is actually present in the

highest-confidence entry (column 11, lines 39 to 49: Figure 3B: Step 348); a confidence

weight is generated for each of the possible matching entries based on the number of

occurrences of each of the words in the phrase and their relative weights; weighted

word searching of a database is well known in the art (column 10, lines 49 to 61: Figure

3B: Step 338); weighting factors are assigned to individual words in a phrase according

to their relative "importance" or "significance"; a lowest weighting factor is assigned to

words such as "a", "an", "the" and other articles; verbs, nouns, adjectives, and proper

names are likely to have a significant relation to the meaning of the phrase, and are

given the highest weighting (column 10, lines 17 to 30);

"means for providing the weighted Boolean query to a search system" –

searching of the databases for information about news, stocks, weather, movies, and

web pages is performed by boolean "AND" search logic for each of the words in the

phrase (or its synonym) (Figure 4);

"means for obtaining results from the search system" – for the highest-confidence

entry, an associated action is performed; for example, if the highest-confidence entry is

"show me the news", the associated action may be to access a predetermined news

web site on the Internet (column 11, lines 50 to 67: Figure 3C: Step 350).

Regarding independent claim 19, *Weber ('524)* further discloses a central

processing unit 102 for performing the method for searching databases (column 5, lines

20 to 33: Figure 1), and storage medium 108 for storing speech recognition processor

220, natural language processor 202, grammar files 212, 214, 216, 217, and natural

language processor database 218 ("a language model"); "a server" is only preambularly

recited in the claim, and is not entitled to patentable weight.

Regarding claim 2, *Weber ('524)* discloses speech recognition processor 220,

natural language processor 202, grammar files 212, 214, 216, 217, and natural

language processor database 218 ("a language model") are searched for matching

words or phrases to interpret the utterance (column 7, line 14 to column 8, line 10).

Regarding claim 8, *Weber ('524)* discloses a procedure for discarding "noise" words for retrieving the highest-confidence entry that does not contribute significantly to the overall meaning of the phrase (column 11, lines 11 to 30: Figures 3B and 3C: Steps 344, 346, and 348); weighting factors are assigned to individual words in a phrase according to their relative "importance" or "significance"; a lowest weighting factor is assigned to words such as "a", "an", "the" and other articles; verbs, nouns, adjectives, and proper names are likely to have a significant relation to the meaning of the phrase, and are given the highest weighting (column 10, lines 17 to 30); thus, weighting individual words in a phrase according to their importance is equivalent to "adjusting a ranking of the results of the search system based on the weights."

Regarding claim 10, *Weber ('524)* discloses the natural language processor 202 determines whether any of the possible matching entries has a confidence value greater than or equal to some predetermined minimum threshold, T; if there is no possible matching entry with a confidence value greater than or equal to T, then an optional error message is displayed (column 10, line 62 to column 11, line 10: Figure 3B: Steps 340 and 342); thresholding is performed prior to a final search with discarded "noise" words from a phrase ("prior to constructing the weighted boolean query") (Figures 3B and 3C: Steps 344, 346, 348); implicitly, if there are no matching entries with a confidence value greater than or equal to T, the search is discarded.

Regarding claim 11, *Weber ('524)* discloses boolean tester 210 performs a boolean "AND" test to determine whether each one of the non-noise words in the phrase (or its synonym) is actually present in the highest-confidence entry (column 11,

lines 39 to 49: Figure 3B: Step 348); because synonyms are alternatives to each of the

words in the phrase being searched, using synonyms in a search query is equivalent to

an "OR-query".

Regarding claim 12, *Weber ('524)* discloses a procedure for discarding "noise"

words for retrieving the highest-confidence entry that does not contribute significantly to

the overall meaning of the phrase (column 11, lines 11 to 30: Figures 3B and 3C: Steps

344, 346, and 348); after an initial search, a highest-confidence entry is determined

(column 10, line 62 to column 11, line 11: Figure 3B: Steps 338 and 340); thus,

providing a highest-confidence entry after discarding "noise" words is equivalent to

"refining the weighted boolean search based on the results of the search system."

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 3, 4, 9, 13, and 14 are rejected under 35 U.S.C. 103(a) as being

unpatentable over *Weber ('524)* in view of *Mahajan et al.*

Concerning claim 3, *Weber ('524)* does not expressly disclose updating a

language model, phonetic dictionary, or acoustic model using the voice search query,

although it is common in the art to adapt or update models in speech recognition.

However, *Mahajan et al.* teaches information retrieval and speech recognition based on

language models, wherein the language model 70 is adapted on-the-fly after the query

has been executed against a relevancy measure for each of the documents. (Column

9, Line 40 to Column 10, Line 11: Figure 3: Steps 94, 96, and 98) *Mahajan et al.*

suggests that adapting a language model has the advantage of improving the accuracy

and speed of the recognition process. (Column 3, Lines 16 to 28) It would have been

obvious to one having ordinary skill in the art to update a language model as suggested

by *Mahajan et al.* in the speech recognition and natural language interactive user

interface of *Weber ('524)* for the purpose of improving the accuracy and speed of the

recognition process.

Concerning claim 4, *Weber ('524)* discloses identifying context-specific

grammars 212 ("a language model"), and using the identified language model to derive

recognition hypotheses. (Column 7, Lines 14 to 45; Column 8, Lines 11 to 38: Figure

3A: Steps 302, 304, and 306) The only element not expressly disclosed by *Weber*

('524) is a language model based on "at least one characteristic associated with the

user". However, a context-specific grammar may be based on a subject commonly

accessed by the user. *Mahajan et al.* teaches information retrieval and speech

recognition based on language models, wherein topic dependent language models can

be retrieved based on input by the user as to the subject. (Column 7, Lines 32 to 38)

Moreover, if a user may tend to dictate more formal documents, the system can be

configured to generate documents with a language model adapted to formal documents.

(Column 10, Lines 12 to 66) It would have been obvious to one having ordinary skill in

the art to identify a language model to derive recognition hypotheses based on a

characteristic associated with the user as suggested by *Mahajan et al.* in the speech

recognition and natural language interactive user interface of *Weber ('524)* for the

purpose of improving the accuracy and speed of the recognition process.

Concerning claim 9, *Weber ('524)* discloses providing a highest-confidence entry

based on a weighted search query, but does not expressly disclose organizing the

results based on the weights. However, those skilled in the art know it is common to

organize search results by relevancy to assist the user in more readily identifying a

desired document. *Mahajan et al.* teaches information retrieval and speech recognition

based on language models, wherein the system determines a relevancy measure of

each document, and ranks the documents according to relevancy. (Column 14, Lines

27 to 44: Figure 4: Step 118) It would have been obvious to one having ordinary skill in

the art to organize documents retrieved from a search by relevancy as suggested by

Mahajan et al. in the speech recognition and natural language interactive user interface

of *Weber ('524)* for the purpose of assisting the user to more readily identify a desired

document.

Concerning claims 13 and 14, *Mahajan et al.* teaches adapting a language model

based on the information retrieved as a result of the executed query. (Column 8, Lines

16 to 53) *Weber ('524)* discloses that phrases having no matching entry with a

confidence value greater than a threshold have zero hits, and produce an error

message. (Column 11, Lines 1 to 10) Thus, these search results are discarded.

Adapting a language model involves adjusting weights of a language model in

accordance with the number of times a term is used to improve performance of the

language model. Thus, adapting a language model begins by determining a number of times a word or phrase of a language model is used. Implicitly, if a word or phrase is not used at all, then a zero, or near zero, weighting is applied. If a word or phrase is used, then adaptation involves adjusting the weight of the word or phrase in the language model in accordance with the number of times the word or phrase is used.

5.   Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Weber ('524)* in view of *Padmanabhan et al.*

Weber ('524) discloses refining a search query based on eliminating "noise" words, but does not expressly disclose detecting compound words in recognition hypotheses, constructing the weighted boolean queries with detected compounds, and refining the weighted Boolean query based on detected compounds to provide new search results. However, *Padmanabhan et al.* teaches a method and apparatus for forming compound words in speech recognition, wherein a compound word formation module changes acoustic and/or language model vocabularies to improve speech recognition performance. (Column 5, Lines 56 to 61) After the training corpus, language model, and acoustic vocabulary have been augmented with compound words, the hypothesis search module may perform improved recognition with the augmented language model and augmented acoustic vocabulary. (Column 10, Lines 5 to 15) It would have been obvious to one having ordinary skill in the art to augment a language model and acoustic vocabulary with compound words as taught by *Padmanabhan et al.*

in the weighted speech recognition and natural language interactive user interface of

Weber ('524) for the purpose of improving recognition performance.

Response to Arguments

6.   Applicants' arguments filed 21 January 2005 have been fully considered but they

are not persuasive.

Firstly, Applicants argue that Weber ('524) does not disclose or suggest

constructing a weighted boolean query using the recognition hypotheses. Applicants

cite Weber ('524) at Column 11, Lines 39 to 49 and Column 10, Lines 49 to 61, but

maintain that Weber ('524) does not disclose constructing a weighted boolean query

using the recognition hypotheses. This argument is traversed.

Weber ('524) does disclose constructing a weighted boolean query using at least

one recognition hypothesis. (It should be noted that independent claims 1 and 17 to 19

only positively require one recognition hypothesis, as the claims are limited to "deriving

one or more recognition hypotheses" or "at least one recognition hypothesis".) Column

11, Lines 39 to 49 is cited to show that Weber ('524) searches a natural language

processing (NPL) database with boolean logic. Specifically, Weber ('524) provides a

boolean "AND" test, which presumes all the words in a natural language query are

"AND"-ed together to produce a search result. However, Weber ('524) also excludes

certain words entirely from a constructed boolean query and provides various

weightings for other words according to their significance. Weber ('524) says that only

non-noise words are included in a boolean "AND" test of a query. Noise words are said

to include articles, pronouns, conjunctions, and words of a similar nature, which are

discarded from a search phrase. (Column 11, Lines 11 to 23) Further, weighting

factors are assigned to individual words in a phrase according to their relative

"importance" or "significance". A lowest weighting factor is assigned to words such as

"a", "an", "the" and other articles. Verbs, nouns, adjectives, and proper names are likely

to have a significant relation to the meaning of the phrase, and are given the highest

weighting. (Column 10, Lines 17 to 30) Applicants cite *Weber ('524)* at Column 10,

Lines 49 to 61, where it is noted that weighted word searching is well known in the art.

Apparently, Applicants have overlooked Column 10, Lines 17 to 30 and Column 10,

Lines 45 to 49 of *Weber ('524)*, where a procedure for weighted word searching is

expressly detailed. Thus, *Weber ('524)* discloses constructing weighted boolean

queries.

Secondly, Applicants argue that *Weber ('524)* does not disclose or suggest

searching databases for news, stocks, weather, movies, or web pages. This position is

traversed.

Weber ('524) discloses a natural language processing (NPL) database for

providing information about news, stocks, weather, movies, and web sites. A user

speaks a natural language phrase "show me the news", and a database is searched to

display images associated with the news by accessing a news web site. (Column 11,

Lines 50 to 67: Figure 4) A user asks a natural language phrase "how much is IBM

stock selling for today", and an NPL database accesses a stock price web site.

(Column 12, Lines 15 to 50: Figure 4) Similarly, a user can ask a natural language

question about movies or weather, whereupon actions direct a user to movie or weather
web sites. (Figure 4) Thus, *Weber ('524)* discloses searching databases for news,
stocks, weather, movies, and web pages.

Thirdly, Applicants argue that *Weber ('524)* does not disclose or suggest
adjusting a ranking of possible matching entries, as claimed in claim 8. This position is
traversed.

Weber ('524) discloses assigning weights to search terms in a search query, so it
must follow that rankings of search results are adjusted as weights are applied.
Weighting factors are assigned to individual words in a phrase according to their relative
"importance" or "significance". A lowest weighting factor is assigned to words such as
"a", "an", "the" and other articles. Verbs, nouns, adjectives, and proper names are likely
to have a significant relation to the meaning of the phrase, and are given the highest
weighting. (Column 10, Lines 17 to 30) A ranking of search results where search terms
are weighted according to a significance of individual words provides a different ranking
than if there were no weighting of individual words according to a significance. Thus,
assigning weights to individual words in a search phrase adjusts a ranking of search
results.

Finally, Applicants argue that *Mahajan et al.* does not disclose or suggest the
limitations of claims 13 and 14, directed to determining a quantity of results relating to
each recognition hypothesis, and then either discarding the recognition hypothesis
having no results or adjusting a weight of results based on the quantity. This position is
traversed.

Mahajan et al. suggests adapting a language model, a procedure that meets the

limitations of claims 13 and 14, as broadly construed. Adapting a language model

involves adjusting weights of a language model in accordance with the number of times

a term is used to improve performance of the language model. Thus, adapting a

language model begins by determining a number of times a word or phrase of a

language model is used. This is equivalent to "determining a quantity of results related

to each recognition hypothesis." Implicitly, if a word or phrase is not used at all, then a

zero, or near zero, weighting is applied. A zero weighting is equivalent to "discarding

recognition hypotheses having no results." If a word or phrase is used, then adaptation

involves adjusting the weight of the word or phrase in the language model in

accordance with the number of times the word or phrase is used. Adjusting a weighting

of a word or phrase in a language model according to the number of times it is used is

equivalent to "adjusting the weight associated with the recognition hypothesis based on

the quantity." Compare Applicants' Specification, ¶'s [0074] - [0075]. Thus, adaptation

provides correct hypotheses are given greater weights in accordance with the number

of times that a particular hypothesis is correctly recognized.

Therefore, the rejections of claims 1, 2, 8, 10 to 12, and 17 to 19 under 35

U.S.C. 102(e) as being anticipated by *Weber ('524)*, of claims 3, 4, 9, 13, and 14 under

35 U.S.C. 103(a) as being unpatentable over *Weber ('524)* in view of *Mahajan et al.*,

and of claims 15 and 16 under 35 U.S.C. 103(a) as being unpatentable over *Weber*

('524) in view of *Padmanabhan et al.*, are proper.

Allowable Subject Matter

7.   Claims 20 to 24 are allowed.

8.   Claims 5 to 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9.   **THIS ACTION IS MADE FINAL.** Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (703) 308-9064. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Richemond Dorvil can be reached on (703) 305-9645. The fax phone

number for the organization where this application or proceeding is assigned is 703-

872-9306.

Information regarding the status of an application may be obtained from the

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ML
4/27/05

Martin Lerner
Examiner
Group Art Unit 2654